APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/661,211	09/12/2003	Gyan P. Sinha	061801/1068	7189

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EXAMINER
SHUMATE, PAUL W

ART UNIT	PAPER NUMBER
3693	

MAIL DATE	DELIVERY MODE
10/07/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

-- *The MAILING DATE of this communication appears on the cover sheet with the correspondence address* --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS,
WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _6 June 2008_.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-32_ is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☐ Claim(s) _____ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

<div align="center">DETAILED ACTION</div>

<div align="center">Status of Claims</div>

1.   This action is in reply to the communication filed on 6/6/2008.

2.   Claims 1-2, 4-10, 16-26, 28, 29, 31, and 32 have been amended by Applicant.

3.   Claims 1-32 are currently pending, have been examined, and stand rejected.

<div align="center">Claim Objections</div>

4.   Previous claims objections are moot in view of Applicant's amendments to claims 16 and 17.

<div align="center">Claim Rejections - 35 USC § 112</div>

5.   Previous claims rejections under 35 USC 112, second paragraph, are moot in view of Applicant's

amendments to claims 1-2, 4-10, 16-26, 28, 29, 31, and 32.

<div align="center">Claim Rejections - 35 USC § 102</div>

6.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for

the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or
> in public use or on sale in this country, more than one year prior to the date of application for
> patent in the United States.

7.   Claim(s) 1-5, 7-13, 15-21, 23-29, 31, and 32 rejected under 35 U.S.C. 102(b) as being anticipated

by Lange, U.S. Patent No.: 6,321,212.

As per claims 1, 9, 17, and 25, Lange teaches identifying a plurality of price buckets/states (see

at least column 2 lines 1-6, column 10 lines 47-49, column 36 lines 20-26, and column 49 lines 6-7)

calculating bucket/state transition probabilities for a security (see at least Table 3.1.7-1 and column 49

lines 5-53) estimating a bucket/state transition distribution for the security using the calculated bucket

transition probabilities (see at least Table 3.1.7-1, column 2 lines 7-19, column 16 lines 24-29, column 34 lines 23-26, and column 77 lines 14-22) where the method can be adapted for bonds, along with many other financial products (see at least column 7 lines 35-40, column 23 lines 47-49, column 46 lines 34-36, and column 55 lines 20-45).

As per claims 2, 3, 10, 11, 18, 19, 26, and 27, Lange further teaches including exit states (see at least column 10 lines 44-50) based on default (see at least column 49 lines 6-7 and column 49 lines 49-53), call (see at least column 53 lines 42-49), and maturity date events (see at least column 45 lines 43-44).

As per claims 4, 5, 7, 8, 12, 13, 15, 16, 20, 21, 23, 24, 28, 29, 31, and 32 Lange further teaches determining the probability that a financial product is in a particular state at a specific time (see at least column 12 lines 2-5, column 37 lines 43-45, column 54 lines 48-65, and column 114 lines 28-32) where the state is default (see at least column 49 lines 6-7 and column 49 lines 49-53) and a default rate is determined for a particular time (see at least column 49 lines 4-10 and column 79 lines 25-30). Lange further teaches running many simulations/scenarios (see at least column 77 lines 1-7 and column 82 lines 13-15) to obtain a probability distribution for a financial product or for a given group of financial products (see at least column 77 lines 49-59 and column 80 lines 23-32) which may include Monte Carlo Simulations (see at least column 77 lines 1-13) and Historical Simulations (see at least column 78 lines 3-7).

Claim Rejections - 35 USC § 103

8.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9.   Claim(s) 6, 14, 22, and 30 rejected under 35 U.S.C. 103(a) as being unpatentable over Lange in view of Official Notice.

10.   Lange does not specifically teach determining a cumulative default rate for a number of time periods by summing default balances for each of the number of time periods and dividing the sum by an average balance for a first of the number of time periods. Determining a cumulative default rate for a number of time periods is substantially the same as determining the cumulative frequency or the cumulative frequency distribution of the default state across a set number of time periods. The examiner takes Official Notice that determining the cumulative frequency of a variable across a specific range is old and well known in the field of probability theory and statistics. Further, cumulative frequency is related to frequency distribution in the same way that a cumulative distribution function (CDF) is related to a probability distribution function. Lange teaches determining the probability distribution function of a set of states throughout the disclosure. Lange also briefly teaches finding calculating a CDF (cumulative distribution function) as well (see at least column 38 line 8). Therefore it would have been obvious at the time the invention was made to someone having ordinary skill the art of risk analysis and management along with having ordinary skill in art of probability theory and statistics to include the specific limitation of determining a cumulative default rate for a number of time periods because this measure of default frequency can be used to determine whether two empirical bond transition distributions are different or whether an empirical distribution is different from an ideal distribution. Further, the cumulative distribution function can be used to check for cycles or patterns which may effect test data results.

Response to Arguments

11.   Applicant's arguments filed 6/6/2008 have been fully considered but they are not persuasive.

12.   For the sake of clarification, just as applicant's disclosure states, the term "buckets" means substantially the same thing as "states."

13.   Regarding Applicant's arguments, Applicant first argues that Lange does not teach or suggest "calculating bucket transition probabilities" and "estimating a bucket transition distribution," and further states that "no calculation of probabilities is actually made and no probabilities of transitioning between states is even implied." The examiner respectfully disagrees.

14.   First, Lange teaches defining states, which are collectively exhaustive, which cover a range of possible outcomes associated with an observable event of economic significance. The states form the basis of a probability distribution defined over discrete outcome ranges (see at least column 16 lines 24–29, column 23 lines 40-42, and column 36 lines 20-32). In order for the states to form the basis of a probability distribution, the probabilities of each state occurring must be calculated or determined in some way. Lange teaches many ways of calculating each state's probability of occurrence through out the disclosure.

15.   As one example, Lange teaches calculating the implied probabilities of all the individual states' occurrence, based on the total distribution of amounts invested in the various states by all the traders participating in the market (see at least column 34 lines 23-31). The implied state probabilities may be calculated from the distribution of the invested amounts for all the states (see at least column 35 lines 12-13). The amount invested in each state is a function of not only trader preferences, but also of each trader's probability assessment (or personal estimation/calculation/determination) of whether that state will occur or not occur (see at least column 36 lines 45-46). Regardless of whether or not one considers the traders' investment distributions and therefore their probability assessments to be good information to base overall event probability calculations on, Lange does explicitly teach calculating the implied state probabilities based on this information.

16.   As a second example, Lange teaches using this method to assess/calculate corporate bond

credit risk. Lange first specifies states to include credit events, such as the event that one of the major

credit rating agencies changes the rating for some or all of a corporation's outstanding securities over a

certain period of time (see at least column 48 lines 60-65). More specifically, states are defined using

S&P's credit rating categories, ranging from AAA to D (default) (see at least column 49 lines 4-7). The

probabilities that a bond will transition from one rating/state/bucket to another rating/state/bucket are

calculated using known data, such as known historical data regarding the frequency of occurrence of

these defined states (see at least column 49 lines 7-10). An example of the calculated state transition

probabilities is clearly displayed in Table 3.1.7-1, in column 49 of Lange. The examiner specifically points

out and draws Applicant's attention to the first three columns of Table 3.1.7-1, titled *Current Rating*, *To*

New Rating, and *Historical Probability*, respectively. Further support for the disputed limitations is shown

in column 49 lines 49-53, where Lange teaches as an example, using this method to determine the risk of

a bond getting downgraded (transitioning to a different state) to an issuer default or "D" rating.

17.   Further, Lange specifically discusses the application of using this risk assessment method with

regards to determining *Mortgage Prepayment Risk*. In this case, Lange would be calculating all the

different probabilities that an owner or investor of a mortgage would face the risk of being "called out" of

his position if the borrower's of a mortgage exercised options to refinance or "prepay" their existing loans

(see at least column 53 line 35 to column 54 line 4).

18.   Applicant also seems to argue that the probability calculations of a state's occurrence, as taught in Lange, are only concerned with which single state a financial product would be in when the termination criteria are met and therefore transitions between states are not being considered.   The examiner respectfully disagrees and asserts that Lange does in fact very clearly teach considering the probability and risk of transitions between states, see at least Table 3.1.7-1 in column 49 as addressed above. Further, regarding the argument that Lange is only concerned with the probability of occurrence of the single state that a financial product ends up in when termination criteria are met, the examiner again directs Applicant to column 49 and also points out that in column 54 lines 47-65, Lange teaches calculating and considering conditional events, such as the conditional probability of state A given the prior occurrence of state B. Therefore the probabilities of non-terminating states occurring is also clearly calculated and considered.

19.   Applicant argues that the examiner did not take Official Notice that it is old and well known in the art to calculate the probabilities of transitions of bonds between a plurality of price buckets as claimed and estimating a bucket transition distribution as claimed, the examiner agrees with this.   However, this argument is irrelevant since both limitations are taught in Lange as explained above.   Further, the examiner has reworded the rejection under Official Notice, as shown above, to more clearly recite and explain what the examiner considers to be old and well known in the art. Based on the what is disclosed and Lange and what is old and well known in the art of probability theory and statistics, the additional limitation of determining the cumulative default rate over a given period of time by summing default balances for each of the number of time periods and dividing by an average balance for a first of the number of time periods is found to be an obvious modification to the prior art.

20.   The examiner also notes column 55 lines 18-38 which discusses the specific application of assessing and managing risk when creating securities or portfolios of securities, such as bonds and asset-backed securities, and column 71 lines 4-32 which discusses calculating market and credit risks to determine the probability distribution of profits and losses applicable to a specific portfolio to determine capital-at-risk using common methods such as value-at-risk, Monte Carlo Simulations, and Historical Simulations.

Conclusion

21.   **THIS ACTION IS MADE FINAL**. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a). A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

22.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paul Shumate whose telephone number is 571-270-1830. The examiner can normally be reached on M-F 8:30 AM - 6:00 PM, EST alt Fridays off.

23.   If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Kramer can be reached on 571-272-6783. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

24.   Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/James A. Kramer/	Name:	Paul W. Shumate
Supervisory Patent	Title:	Patent Examiner
Examiner, Art Unit 3693	Date:	9/29/08
	Signature:	/Paul Shumate/
		Examiner, Art Unit 3693